

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT

WRITTEN OPINION
(PCT Rule 66)

| | | | |
|---|--|--|------------|
| Applicant's or agent's file reference INT.1075MAJR | | Date of mailing (day/month/year) | 15.10.2003 |
| International application No. PCT/ZA02/00211 | | International filing date (day/month/year) | 17.12.2002 |
| | | Priority date (day/month/year) | 03.01.2002 |
| International Patent Classification (IPC) or both national classification and IPC F42D3/04 | | | |
| Applicant VAN DYK, Andre | | | |

- This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain documents cited
 - ☐ Certain defects in the international application
 - ☐ Certain observations on the international application
- The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
- The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 03.05.2004

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ATTACHMENT "E"

WRITTEN OPINIONInternational application No. **PCT/ZA02/00211****I. Basis of the opinion**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-21 as originally filed

Claims, Numbers

1-30 received on 01.08.2003 with letter of 30.07.2003

Drawings, Sheets

1/11-11/11 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this opinion.)

6. Additional observations, if necessary:

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Re Item V**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. US 5 765 923 A (D1), in particular figures 3 and 9 - 11, as well as corresponding column 14, line 51 - column 15, line 32, describes a method for breaking rock including the steps of:
 - (a) loading at least a first cartridge into a hole in a rock face;
 - (b) confining the cartridge in the hole;
 - (c) initiating a propellant in the cartridge thereby causing the release of pressurised material;
 - (d) supporting a base of the cartridge to prevent the base from fracturing under the effect of the pressurised material; and
 - (f) directing the pressurised material at least to a periphery of the base to initiate breakage of rock adjacent the periphery.
2. The subject matter of amended independent claim 1 differs from this prior art by an additional method step (e) based on original dependent claims 5 and 6.

According to method step (e) the pressure wave is deformed by means of one or more wave deforming members on an inner or outer side of the cartridge to create at least one region inside the hole which has an increased stress concentration.

3. Consequently the problem to be solved by the present application can be formulated as: How can an increased stress concentration in at least one region inside the hole be created compared to the method of D1?

It is known to the man skilled in the art of breaking rock by means of pyrotechnic compositions, that an increased stress region can be created in a hole by means of deforming the pressure wave created by the pyrotechnic composition.

It is for example known in the art of rock breaking by means of pyrotechnic compositions, that a detonation wave resulting from the detonation of an explosive can be deformed by means of wave deforming members, as for example shown in SU 1 800 257 A (D2) or by means of focusing charges as shown in US 3 654 866 A (D3).

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It is self-evident to the man skilled in said art, that if a detonation wave travelling at about the speed of sound can be deformed, a pressure wave travelling at sub-sonic speed, such as the pressure wave resulting from deflagration can also be deformed. In particular a deforming member as shown in D2 will function as well for a detonation wave as for a sub-sonic deflagration pressure wave.

Therefore the incorporation of method step (e) in the amended independent claim 1 does not require the exercise of inventive skills.

4. Consequently the subject matter of present independent claim 1 does not involve an inventive step.
5. Dependent claims 2 - 20 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

The features of dependent claims 2, 5 and 6 are known from or suggested by the combination of D1 and D2.

The features of dependent claims 3, 4, 7 and 13 are known from or suggested by SU 1 362 213 A (D4).

The features of dependent claims 8 - 12 are known from US 6 148 730 A (D5).

The features of dependent claims 13 - 20 are known from D3.

6. D1 furthermore describes an apparatus for breaking rock, which includes a first cartridge with a base (27) and a side wall which form an enclosure, and a propellant (30) inside the enclosure, and wherein a discontinuous relatively weaker section region (32) of the container is formed at a junction between the wall and the base.

The subject matter of amended independent device claim 21 differs from this prior art in the presence of a pressure wave deforming member.

The same reasoning as in points 3 and 4 above also applies to the subject matter of the amended independent device claim 21.

Consequently also the subject matter of independent claim 21 does not involve an

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inventive step.

7. Dependent claims 22 - 30 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

The features of dependent claims 22 - 27 are known from or suggested by a combination of D1 and D2/D3.

The features of dependent claims 28 - 30 are known from or suggested by D5.

8. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

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PCT/ZA02/00211**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

| | | |
|-------------------------------|--------|------|
| Novelty (N) | Claims | |
| Inventive step (IS) | Claims | 1-30 |
| Industrial applicability (IA) | Claims | |

2. Citations and explanations**see separate sheet**